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DAMPING CHARACTERISTICS OF AN UNDAMPED AN/SQS-26 SONAR DOME SEC--ETC(U)
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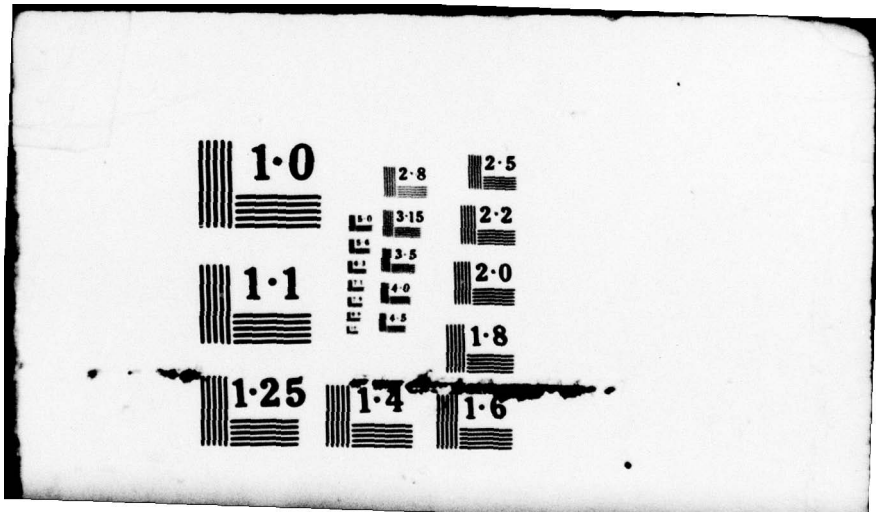
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(6) DAMPING CHARACTERISTICS OF AN UNDAMPED AN/SQS-26 SONAR DOME SECTION.

by

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USL Technical Memorandum No. 2133-873-66

(11) 16 September ~~16, 1~~966

INTRODUCTION

This technical memorandum presents the damping characteristics of an undamped AN/SQS-26 sonar dome section in air. The data will be used as a reference for data to be taken on damped AN/SQS-26 sonar dome sections of the same size.

DESCRIPTION OF TESTS (12) 3p.

The dome section was suspended in air using nylon rope. An accelerometer was bonded to the center of one of the panels of the dome section using Eastman 910 adhesive. The dome section was excited by impact, and the decay of the vibration was sensed by the accelerometer, the output of which was to filter 1/3 octave bands at various center frequencies from 250 Hz to 16000 Hz, logarithmically amplified, and displayed on the storage oscilloscope. The instrumentation was calibrated using the method described in reference (a). Test details are discussed in reference (b). Determination of the damping coefficient was made by method 1 that is discussed in reference (c).

The decay rate in db./sec. can be found from the relationship

$$D = \frac{my}{nx}$$

where: m is the calibration constant of the vertical scale of the oscilloscope, db./cm.

n is the calibration constant of the horizontal scale of the

oscilloscope, sec./cm.

y is the vertical amplitude of the pulse, cm.

x is the distance on the abscissa from the pulse to the end of the decay, cm.

The percent of critical damping is

$$\%C/Cc = 1.84 \frac{D}{f}$$

where: D is the decay rate in db./sec.

f is the 1/3 octave band center frequency.

RESULTS

Figure 1 is a plot of the percent of critical damping vs. 1/3 octave band center frequency for the undamped AN/SQS-26 sonar dome section in air. It can be seen that the percent of critical damping varies from 0.013 to 0.088 in the frequency range from 250 Hz to 16000 Hz.

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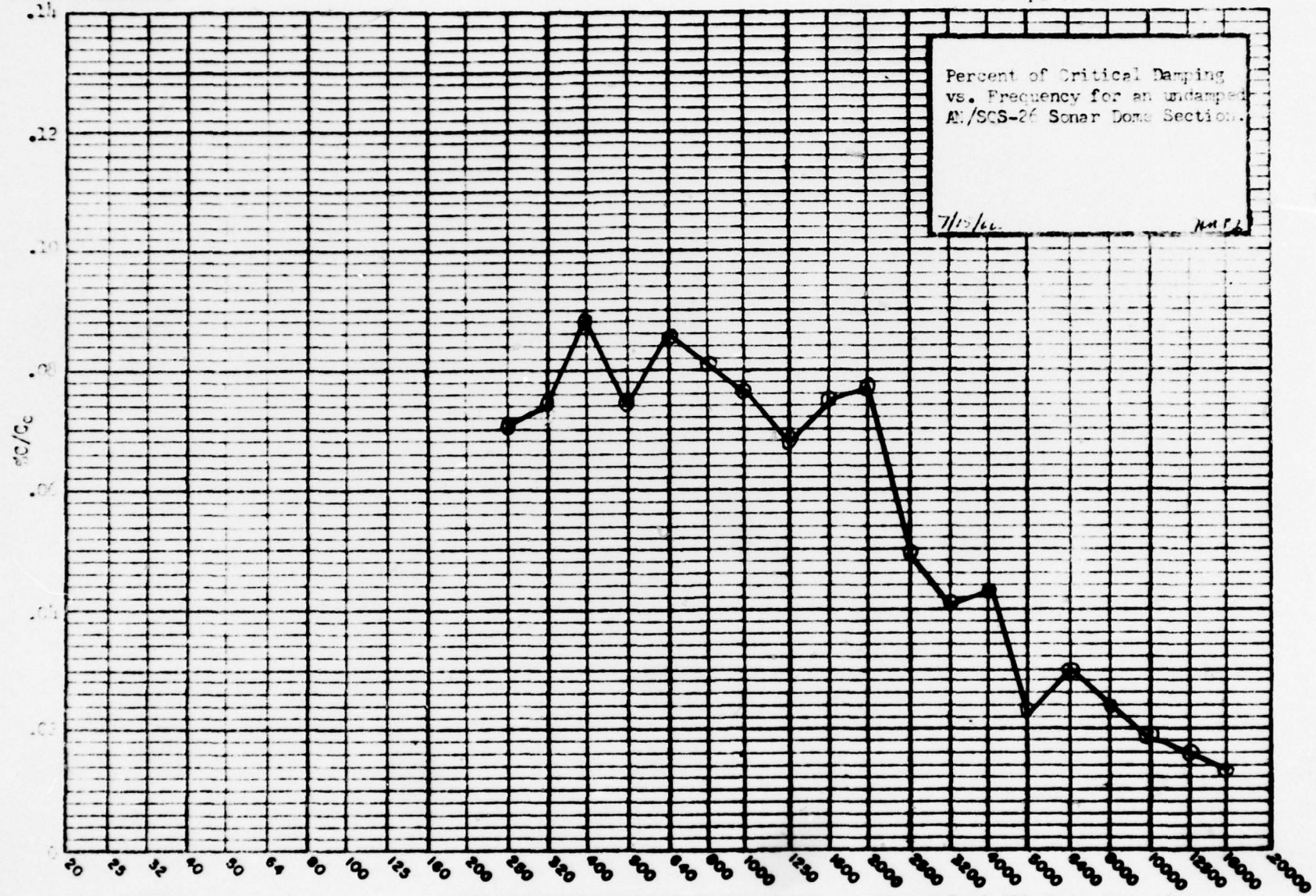
LIST OF REFERENCES

(a) H. N. Phelps. Jr. and M. F. Borg, "Calibration of Instrumentation for Vibration and Damping Tests", USL Technical Memorandum No. 933-236-66, 22 August 1963.

(b) H. N. Phelps, Jr., "Damping Characteristics of Three Untreated Steel Plates", USL Technical Memoradum No. 933-54-64, 17 February 1964.

(c) H. N. Phelps, Jr., "Two Methods of Determining Damping of Free Damped Systems", USL Technical Memorandum No. 933-329-63, 4 December 1963.

Temp. 78°F.



3/30/64-200-FOURTH RUN-EXPERIMENTAL

THIRD-OCTAVE BAND CENTER FREQUENCY IN CPS

Figure 1 of USL Tech. Memo. No. 2133-873-66.